ARTICLE 6 TRAFFIC IMPACT STUDIES

§180-601. Intent

The intent of a traffic impact study is to identify and plan for safe means of ingress and egress for proposed developments; understand the adequacy of the existing transportation network for the intended use; to identify any potential transportation impacts of the proposed subdivision and/or land development; and to determine any roadway or traffic signalization improvements necessary to mitigate any impacts resulting from the planned development.

§ 180-602. General Provisions

A. A traffic impact study shall be submitted for subdivision and land developments which meet the following criteria:

- 1. Residential. Involving fifty (50) or more dwelling units.

2. Non-residential. Involving one hundred (100) or more new peak hour trips.

3. Other. Whenever the Township shall find that there is a reasonable ground to believe that the existing transportation network may be inadequate to handle the volume or character of traffic likely to result from the proposed subdivision or land development.

B. The study shall be prepared, signed and sealed by a Professional Engineer registered in the Commonwealth of Pennsylvania with sufficient prior traffic study and traffic engineering experience to qualify the engineer to perform the study and render any opinions and recommendations set forth therein.

C. Study area boundaries shall be determined in accordance with the publication referenced in Section 180-703 below and through discussions with the Township Engineer. At a minimum, the study area shall include any intersection that experiences an increase of fifty (50) peak hour directional trips attributed to the development and other intersections which, in the opinion of the Township, warrant inclusion in the study. A pre-study conference between the Applicant's Traffic Engineer and the Township is required prior to undertaking the traffic impact study. Where a subdivision or land development project requires access to a State highway and meets the requirements of the Pennsylvania Department of Transportation (PENNDOT) for a traffic study, then PENNDOT shall also be consulted regarding the scope of the study prior to proceeding with the work.

§180-603. Contents

The study shall be prepared in accordance with the Institute of Transportation Engineer's (ITE) *Traffic Engineering Handbook* an ITE's *Transportation Impact Analyses for Site Development,* current editions and PENNDOT Publications 212 and 282, current editions and the requirements contained herein.

A. General Site Description.

1. The site description shall include the size, location, existing and proposed land uses, current zoning, construction phasing, and completion date of the proposed land development. Any residual land which, when developed, will utilize the proposed improvements shall be planned for as the highest and best use for the residual property and shall be included in the study. A brief description of other major existing and proposed land developments within the study area shall be provided.

B. Transportation Facilities Description.

1. Proposed Internal Transportation System. Describe the proposed vehicular bicycle and pedestrian circulation, ingress and egress locations, existing or proposed internal roadways including the widths of cartways and rights-of-way, parking conditions, traffic channelizations and any other traffic control devices within the site of the subdivision or land development.

2, External Transportation System. Describe the entire external roadway system within the study area for the proposed subdivision or land development including major intersections, traffic control devices, parking conditions, widths of cartways and rights-of-way, and vehicular, bicycle, and pedestrian circulation. Key intersections in the study area shall be identified and described. Current photographs of the study intersections depicting all approaches shall be included in the study. All planned or programmed public and/or private highway improvements, including proposed roadway construction and traffic signalization, shall be noted. Any proposed roadway improvements planned and approved from surrounding developments shall also be recorded.

C. Existing Traffic Conditions.

1. Existing traffic conditions shall be determined for all roadways and intersections in the study area. Existing traffic volumes for average daily traffic, peak highway hour(s) traffic, and peak development-generated hour(s) traffic shall be collected. Manual traffic counts at key intersections in the study area shall be conducted, encompassing the peak highway and development-generated hour(s). A volume capacity analysis

based upon existing volumes shall be performed during the peak-highway hour(s) and the peak development-generated hour(s) for all roadways and key intersections in the study area using the methodologies presented in the current edition of the Transportation Research Board's *Highway Capacity Manual,* current edition. Levels of service shall be determined for all roadways and key intersections. Traffic signal warrant analyses shall be conducted for all unsignalized intersections in accordance with PENNDOT Publication 212. Gap studies and queue length analysis shall also be completed for all key intersections. The analysis of the existing road network will be based on the current geometric condition and traffic conditions.

Future Trip Projections.

1. Estimation of vehicular trips to result from the proposed development shall be completed for the average daily, peak highway hour(s) and peak development-generated hour(s). Vehicular trip generation rates to be used for this calculation shall be based on *ITE's Trip General Manual,* and *ITE's Trip Generation Handbook,* current editions, and/or data collected from sites with similar trip generation characteristics. This existing data shall be collected in conformance with the guidelines presented in the ITE Trip Generation Handbook. Also, provide an estimate of anticipated truck volumes in the study. These development-generated traffic volumes shall be provided for the in-bound and out-bound traffic movements and the reference source(s) and methodology followed shall be documented. All turning movements shall be calculated. These generated volumes shall be logically distributed to the study area and assigned to the existing roadways,

and key intersections throughout the study area. The methodology used to distribute trips shall be documented and approved by the Township Engineer.

2. Provide a detailed distribution and assignment of any passby trips. Document all assumptions used in the distribution and assignment phase in a manner which permits the duplication of these calculations. Pedestrian volumes shall also be calculated, if applicable. If school crossings are to be used, pedestrian volumes shall be assigned to each crossing. Any characteristics of the site that will cause particular trip generation problems shall be noted.

3. Background growth using the latest edition of the PENNDOT Publication entitled Pennsylvania Traffic Data and projected traffic from approved but not yet built subdivisions or land developments which are proximate to and will have an impact on the study points shall be included in the projection of future traffic.

4. All future analyses shall be conducted based upon a full build out in the planned opening year plus a ten (10) year horizon period. For phased projects, the entire project shall be assumed to be built out in the opening year plus the aforementioned ten (10) year horizon period.

Transportation Impacts.

1. The study area roadway network is to be analyzed for safety and capacity sufficiency for future network conditions without the proposed development and future network conditions with the proposed development. For each of these conditions, the following analyses shall be completed:

    a. Mainline ADT volumes and turning movement volumes for all key intersections within the study area shall be determined for the AM peak hours, PM peak hours and the proposed development peak hours, if other than either the AM or PM peak hours of the network. Commercial development shall also provide a Saturday peak hour analysis.

    b. The effectiveness of the traffic signal control at all key intersections shall be evaluated by approach in terms of vehicle stops and delays.

    c. Gap studies will be conducted at the proposed site access points to evaluate the need for signal control, turn prohibition or additional site access points to reduce the left volume from the site driveway(s).

    d. Queue length studies using 95% *Highway Capacity Manual* methodologies shall be completed to evaluate the potential for a backup of traffic from controlled intersections which could impact other intersections including access points to the proposed development.

    e. An analysis of the volume and capacity of the network and all key intersections shall be conducted utilizing the most current *Highway Capacity Manual* procedures. Levels of service will be determined and documented.

2. The analysis of the future conditions without the proposed development will document the adequacy of the study area network to accommodate the traffic in the design year(s) without the proposed development. This analysis must include a full consideration of all committed roadway improvements to the study area network when determining the expected levels of service.

3. The analysis of the future conditions with the proposed development will document the impacts created as a result of the development.

F. Conclusions and Recommended Improvements. Levels of service for all street segments and key intersections shall be presented in tabular and graphic form. All street segments and key intersections showing a level of service below D for street segments and signalized intersections, and below E for street segments and unsignalized intersections shall be considered deficient, and specific recommendations for the elimination of these deficiencies shall be listed. This listing of recommended improvements shall include, but not be limited to, the following elements: internal circulation design, site access location and design, external street and intersection design and improvements, traffic signal installation and operation, and transit design improvements. All newly signalized intersections shall be designed to provide a level of service of D or better for all approaches for the horizon year. All un-signalized intersections shall be designed to provide a level of service of E or better for all approaches in the horizon year. All physical on-site improvements shall be shown on the subdivision and /or land development plan and approved by the Township Engineer prior to any plan approval by the Board of Supervisors. Any future phased improvements shall also be planned and represented by a phasing schedule outlining the timeframe or threshold for implementation along with the responsible party. For each recommended off-site improvement, provide a schematic drawing of existing and proposed conditions as well as a narrative description of the improvement, including the estimated cost of the improvements. All recommended improvements shall be clearly feasible from an engineering and construction perspective. Costs shall be separated for any recommended off-site improvements and any required on-site improvements.

§180-604, <u>Final Report</u>

A final report shall be prepared to document the results of the traffic study and the recommended improvements to accommodate the projected traffic due to the proposed development. Provide an executive summary which provides a concise description of the study area, results of the traffic analyses, and any recommended improvements. The presentation of data and analyses results should be accomplished on either schematic diagram of the study area, or through the use of charts and/or tables. All sources of data and methodologies which were used in the study (including computer programs) must be properly referenced and documented. Any waiver requests to the referenced procedures must be properly documented to enable a review of the appropriateness of the modification. Provide all computer output and calculations in appendices.

§ 180^605, <u>Responsibility for Improvements</u>

Where the traffic impact study indicates that on-site improvements are necessary or advisable to existing Township and/or State streets and intersections in order (i) to assure adequate, safe and convenient access to each lot and structure and parking compound proposed as part of the development of the subject tract, (ii) to accommodate the traffic due, to the proposed development, (iii) to provide for an acceptable level of service and delay for the design year, or years for phased projects, with the development which is at least equivalent to the projected level of service and delay for the design year(s) without the proposed subdivision or development, and (iv) to preserve the existing convenience of access to or ability to exit from abutting lots which gain access from the existing street, the Applicant shall install all such indicated on-site improvements. The

Applicant shall install additional traffic lanes, traffic dividers, traffic control devices, traffic signals, and other measures as appropriate to ensure that the development of the subject tract does not adversely impact the existing street system and access to or the ability to exit from lots gaining access from an affected street. If the traffic impact study indicates that on-site improvements must be made to a State roadway, the Applicant shall also take all action necessary to obtain any Pennsylvania Department of Transportation permits and approvals to install the necessary street widening or traffic signals or traffic control devices. If the traffic impact study recommends installation of traffic signals or traffic signal modifications as part of the on-site improvements, the Applicant shall prepare all plans and studies and submit all necessary applications to enable the installation of the traffic signal or modifications and shall install the traffic signal or modifications at their cost and expense. If the traffic impact study indicates that traffic control devices or regulations, including but not limited to stop intersections, speed limit reductions, or parking prohibitions, are required as part of the on-site improvements, the Applicant shall prepare all traffic studies necessary to justify imposition of such regulations in accordance with Pennsylvania Department of Transportation regulations and shall pay all costs associated with the preparation and enactment of an ordinance to establish such regulations:

A. The Applicant shall bear all costs and expenses in connection with the on-site improvements required by this Article. If the Applicant requires the Township to submit any permit applications or requests for approvals in the name of the Township, the Applicant shall reimburse the Township for all costs and expenses incurred by the Township in connection with its review of the application and submission of the application to the Pennsylvania Department of Transportation or any other governmental agency.

B. When the Township determines that a portion or all of the required on-site improvements or that a portion or all of any agreed to off-site improvements are not feasible or appropriate at the present time, the Applicant shall enter into a Applicant's Agreement with the Township and deposit financial security with the Township until such time that the improvements are satisfactorily installed by the Applicant and accepted by the Township in accordance with other provisions of this Ordinance.